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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,505

02/23/2005

Onn Haran

2823/25

7862

44696

7590

05/18/2009

DR. MARK M. FRIEDMAN

C/O BILL POLKINGHORN - DISCOVERY DISPATCH

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EXAMINER

CEHIC, KENAN

ART UNIT

PAPER NUMBER

2416

NOTIFICATION DATE

DELIVERY MODE

05/18/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/525,505	Applicant(s) HARAN ET AL.	
	Examiner KENAN CEHIC	Art Unit 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-14 is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1, 4-8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (US 6,546,014) in view of Patrick (US 2005/0175014).

For claim 1, Kramer discloses in a passive optical network (PON) (see fig 2; 202 and col 2 lines 20-40 "PON") a method for transmitting packets (see col 5 lines 1-14 "frames...IP packets" and fig. 8 ONU-1 through ONU-3 TX) by an optical network unit (ONU) (see fig 2; ONU-1 through ONU-3) comprising the steps of:

receiving a grant (see fig 12; 1206, 1208 and col 6 line 66 through col 7 lines 20 "GRANT message....received by the ONU-1....receiving the GRANT message...") having a grant length (see col 6 lines 66 through col 7 lines 20 "1200 bytes" and col 7 lines 35-45 "OLT has authorized the ONU-1 to send a specific number of bytes by the GRANT message") from an optical line terminal (OLT) (see fig 2; 204 and col 6 line 66 through col 7 lines 20 "OLT...transmits an ONU control message....message...referred to herein as a GRANT message") of the PON (see fig 2; 202 and col 2 lines 20-40 "PON"); and the optical network unit (ONU) (see fig 2; ONU-1 through ONU-3).

For claim 4, Kramer discloses stage variable is selected from the group consisting of reported bytes below threshold (see col 8 lines 15-35 "variable lengths, may not exactly fill the granted window size" and col 8 line 64-25 "grant size...is zero bytes...entryis zero....grant message is zero") , and wherein said performing of a stage test (see col 8 lines 15-35 "variable lengths, may not exactly fill the granted window size" and col 8 line 64-25 "grant size...is zero bytes...entryis zero....grant message is zero") involving a stage variable (see col 8 lines 15-35 "variable lengths, may not exactly fill the granted window size" and col 8 line 64-25 "grant size...is zero bytes...entryis zero....grant message is zero") includes comparing a value of said stage variable to zero (see col 8

lines 15-35 “variable lengths, may not exactly fill the granted window size” and col 8

line 64-25 “grant size...is zero bytes...entry ...is zero....grant message is zero”;

comparing if difference between variable lengths and granted window size is zero).

For claim 5, Kramer discloses said ungranted packet is marked as granted (see col 12-25

“number of bytes...when the REQUEST message was sent,is used by the OLT to update the polling table.... $4300-1200=3100$ ”), if the

result of said comparison (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size”) is that said value of said stage variable (see col 8 lines 15-35

“variable lengths, may not exactly fill the granted window size”) is greater than zero (see col 8 lines 15-35 “variable lengths, may not exactly fill the granted window size”).

For claim 6, Kramer discloses grant is a flexible grant set by said OLT (see col 8 line 64-15 “entry is zero...request ...congaing the last number of bytes waiting in the

buffer....grant message is zero bytes” and col 6 line 55- col 7 line 15 “authorizes...to send 1200 bytes....” and fig 8 ; OLT TX....1200 1.....400 2.....2500 3; grants sent by OLT)

based on information received from the ONU (see col 8 line 64-15 “entry is

zero...request ...congaing the last number of bytes waiting in the buffer....grant message is zero bytes” and col 6 line 55- col 7 line 45“authorizes...to send 1200

bytes....REQUEST message” and col 2 lines 40-57 “request message...updated

information about the current ize of the data...updating the table...Each grant message is indicatiave....amount...dependent on the information included...in the table” and fig 8 ;

OLT TX....1200 1.....400 2.....2500 3; grants sent by OLT).

For claim 7, Kramer discloses information includes a combination of values of

bytes below threshold (see col 8 lines 22-45 "granted window is not fully filled by the data from an ONU.... send less data, leaving the remaining amount....results in underestimated value...bytes received") and total bytes (see col 8 lines 22-45 "bytes received").

For claim 8, said threshold (see col 8 lines 22-45 "granted window is not fully filled by the data from an ONU.... send less data, leaving the remaining amount....results in underestimated value...bytes received") is adaptive (fig 8 ; OLT TX....1200 1.....400 2.....2500 3; and col 7 lines 1-15 "size of granted window" grants sent by OLT).

Kramer is silent about:

For claim 1, based on said grant, calculating an packet egress order that eliminates packet fragmentation.

Patrick from the same or similar field of endeavor discloses a communication system with the following features:

For claim 1, Patrick discloses based on said grant (see section 0012 and section 0015 "classes bandwidth"), calculating an packet egress order that eliminates packet fragmentation (see section 0029 "transmission of packets onto a data transmission link....scheduler...enques the packets and reorders the packets if necessary...predetermined criteria", section 0043 "scheduling priority...serviced in priority order, subject to bandwidth limits", section 0053 "each class in order of priority" and section 0028 "transmitted") .

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Kramer by using the features, as taught by Patrick, in

order to provide a simple and effective algorithm (hierarchical prioritized round robin scheduling) for handling overbooked classes. (see Patrick sections 0005-16).

2. Claim 2, 3, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer et al. (US 6,546,014) and Patrick (US 2005/0175014), further in view of Shi et al. (US 2003/0179769).

For claim 2, Kramer and Patrick disclose the claimed invention as described above.

For claim 2, Kramer further discloses step of calculating (see col 8 lines 21-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”) is preceded by a step of handling out of band information (see col 8 lines 10-40 “updated entry for the ONU-1 can be computed as follows:...updated entry.....situations when the granted window size is not fully filled by the data from an ONU”);

For claim 3, Kramer further discloses checking (see col 8 lines 10-40 “updated_entry...high priority packet....leaving remaining amount of data in the buffer....updated_entry”) said buffer (see fig 2; 212) for ungranted packets (see col 8 lines 10-40 “updated_entry...high priority packet....leaving remaining amount of data in the buffer....updated_entry”), and wherein said step of calculating (see col 8 lines 10-39 “send the higher-priority data packets before the other buffered data....fragmentation is not available....send less data, leaving the remaining amount of data in the buffer”) includes performing a three stage test (see col 8 lines 10-39 “higher-priority....variable lengths, may not exactly fill the granted window size.....If

packet fragmentation is not available" and col 8 line 64-25 "grant size...is zero bytes...entry ...is zero....grant message is zero") on each of said ungranted packets (see col 8 lines 10-40 "updated_entry...high priority packet....leaving remaining amount of data i nthe buffer....updated_entry"), each of said stage tests involving a stage variable test (see col 8 lines 10-39 "higher-priority....may not exactly fill the granted window size.....If packet fragmentation is not available" and col 8 line 64-25 "grant size...is zero bytes...entry ...is zero....grant message is zero").

For claim 9, Kramer discloses said values of bytes below threshold (see col 8 lines 22-45 "granted window is not fully filled by the data from an ONU.... send less data, leaving the remaining amount....results in underestimated value...bytes received") and total bytes (see col 8 lines 22-45 "bytes received").

Kramer is silent about:

For claim 2, includes handling a sub-queue of a given priority.

For claim 3, sub-queue.

For claim 9, accumulated from highest to lowest priority.

Shi from the same or similar field of endeavor discloses a communication network with the following features:

For claim 2, Shi discloses includes handling a sub-queue (see fig 21 "queues" and section 0145 "queues") of a given priority (see section 0125 "Weighted Round Robin" and fig 21 "WRR").

For claim 3, Shi discloses a sub-queue (see fig 21 "queues" and section 0145 "queues").

For claim 9, Shi discloses accumulated from highest to lowest priority (see section 0088-0089 “bigger weight....weight giving to each ONU” and section 00125 “Weighted Round Robin....scheduler....schedule the queues”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Kramer and Patrick by using the features, as taught by Shi, in order to eliminate having an ONU wait for the duration of multiple frames after a transmission and before it can transmit again, thereby to eliminate the related delay variation and/or jitter, which has benefits in voice quality delivery (see section 0019-0022).

Allowable Subject Matter

3. Claim 11-14 are allowed.

For claim 11, the prior art fails to disclose by either anticipation or combination “matching said total byte length with said grant length, wherein said step of matching includes, by each said ONU, hiding from said OLT an update in a queue status, whereby the fragmentation loss is eliminated”. The closest prior art Kramer et al. (US 6,546,014) discloses matching grant length to a total byte length, however does not using hiding an update of the queue status.

Response to Arguments

4. Applicant's arguments filed 02/01/2009 have been fully considered but they are not persuasive.

As regarding claim 1:

For claim 1, the applicant summarizes the disclosure of the Kramer and Patrick references and particularly points out the advantage of scheduling / ordering data in an exact manner inside a received grant, where data is not fragmented to fit the exact length of the grant. The advantage of such a method is improved bandwidth utilization. While the examiner appreciates the technical advantages of applicant's inventions, it is pointed out to the applicant such exact and specific language / features are not described in the claim. Similarly, the applicant argues "handling of fragmentation" is recited in the claim and that the combination of Kramer and Patrick fail to disclose such a limitation.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., scheduling / ordering data in an exact manner inside the respective grant, where data is not fragmented to fit the exact length of the grant and "handling of fragmentation") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The applicant's claim 1 recites "based on said grant, calculating an ONU packet egress order that eliminates packet fragmentation". It is pointed out to the applicant, that the **claim language** "that eliminates packet fragmentation" merely represents an advantage or property (packet fragmentation elimination) of the packet egress order calculated. Prima facie obviousness can not be rebutted by recognizing additional advantages or latent properties, even if they were unknown in the prior art (see MPEP 2145 II.). Thus, the examiner takes the stance that the claim language "order that eliminates packet

fragmentation” is an additional or latent property of calculating a packet egress order, and thus cannot be the basis of patentability (see MPEP 2145 II). The examiner takes the stance that the prior art discloses the claim limitations of calculating a packet order based on a grant and thus also the additional advantage / latent property, even though this property was unknown in the prior art used. As presented in the above rejection Kramer discloses an OLT providing an ONU the right (grant) to transmit a certain amount / bandwidth (length). The ONU has this bandwidth / capacity to send that amount of data. Patrick from the same or similar field of endeavor discloses a generic method of scheduling data transmission based on priority and capacity available to the transmitter. As pointed out in the cited sections (and the overall disclosure) of Patrick, certain data (classes) is transmitted in a order until the assigned bandwidth (quantum / Maximum Assigned Bandwidth), which is based on the transmitters available bandwidth limits / configured capacity (section 0012, 0043, and further explained in 0044 and 0036). Further, on page 8 and 9 the applicant argues that Patrick does not deal with PON networks / elements nor fragmentation. The fragmentation language of the claim was addressed above. In response to applicant's argument that Patrick does not deal with PON networks / elements, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). As applicant points out, Patrick deals with a generic data scheduling technique for

a generic network. Both references refer to transmission of Ethernet / IP / ATM data (see cols 5-6 of Kramer and sections 0032, 0045, 0055 of Patrick), thus combining / adding the scheduling method of Patrick into the Kramer teaching is not precluded. Further, the examiner fails to see how the fact that Kramer's teaching is based on an underlying PON network, precludes combining / adding the scheduling method of Patrick. The applicant does not provide, such evidence or arguments.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Patrick reference / and rejection point out that the motivation is to provide a hierarchical prioritized round robin scheduling for data transmission (of different priorities) which further overcomes problems associated with prior art scheduling methods such as handling of overbooked classes (and further problems and benefits as outlined in Patrick 0005-16), for Kramer's teachings which also transmit data / packets using priority (see Kramer col 8 lines 15-35).

As regarding claim 2:

For claim 2, 3 and 9, the applicant argues that the combination of Kramer, Patrick and Shi does not teach calculating an ONU packet egress order that eliminates packet

fragmentation. This language/ limitations are found in claim 1 and have been rejected based on Kramer and Patrick. The examiner did not allege that rejections utilizing Shi teach this claim language, but that sub queues and sub-queue priorities are thought by Shi.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENAN CEHIC whose telephone number is (571)270-3120. The examiner can normally be reached on Monday through Friday 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, KWANG BIN YAO can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2416

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kenan Cehic/
Examiner, Art Unit 2416

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Supervisory Patent Examiner, Art Unit 2416